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Notes on the extinct Kosrae Starling *Aplonis corvina* Kittlitz, 1833

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The Starlings of the genus *Aplonis*, comprising 24 known species, are virtually confined to the islands of the south-western Pacific, occurring on the mainland only on the Malay peninsular in the west, southern Vietnam in the north, and the tip of northern Australia in the south (Feare & Craig 1998). Six species of the genus are widespread, 8 species inhabit groups of islands, and the rest are endemic to single islands or island pairs; apart from 3 species, all are almost entirely lowland birds. Three of the endemic species are now extinct: Norfolk and Lord Howe Starlings *A. fusca* (2 ssp, Norfolk Island and Lord Howe Island), Mysterious Starling *A. marvornata* (Mauke, Cook Islands) and Kosrae Starling *A. corvina* (*Kosrae, Caroline Islands), with other endemic species being rare and restricted (Greenway 1957, King 1981, Fuller 1987, Feare & Craig 1998). One of the most spectacular species was the Kosrae, Kosrae Island or Kosrae Mountain Starling *A. corvina*, which has not been seen since the 1830s and is known only from 5 specimens. The little that is known about the ecology of this species is based entirely on the work of Kittlitz (1832, 1835, 1858), the only biologist to have seen the bird in life and the collector of all the known specimens.

The Kosrae Starling has been described as a large, red-eyed, glossy black bird with a long curved bill and long tail, and illustrated accordingly (Kittlitz 1832, 1835, Greenway 1957, Day 1981, Fuller 1987). However, during a visit I made to the Russian

*Kosrae Island was formerly known as Kusaie Island, and originally termed Uulan in error (Finsch 1881)

Academy of Sciences, St Petersburg in November 1998, it was readily apparent that the skins there do not fully accord with the published descriptions or any published illustrations. The skins represent juvenile, sub-adult and adult plumage, and are strikingly different from each other. Furthermore, the library of the Russian Academy of Sciences contains a copy of one of Kittlitz's overlooked early publications (Kittlitz 1832) which is not readily available elsewhere and which contains information about the birds' ecology. These Kittlitz notes about the Kosrae Starling are here translated verbatim and presented with a full description of plumage patterns of *A. corvina*. In addition, morphological/biogeographical comparisons are made between *A. corvina* and other *Aplonis* species.

Three specimens, which are housed in the Russian Academy of Sciences, St. Petersburg, were the first individuals known. Mees (1964), who discovered, described and photographed two further *A. corvina* specimens, housed in the collection of the Rijksmuseum van Natuurlijke Historie, Leiden, increased the total number of known museum specimens to five. The morphology of the St. Petersburg and Leiden specimens is also compared in this paper.

Discovery: Kittlitz's description and the bird's ecology

Friedrich Heinrich von Kittlitz (1799-1874), sailing on the corvette *Senjawan*, surveyed areas of the Bering Sea and the Caroline Archipelago (Kittlitz 1858, Steinbacher 1954, Mearns & Mearns 1992). Kittlitz reached the Caroline Archipelago on 1 November 1827, returning north via the Bonin Islands (Kittlitz 1858, Mearns & Mearns 1992). During these visits to both the Caroline and Bonin Islands, Kittlitz collected a series of birds, some never seen again. Included in his collection were specimens of *A. corvina*, taken from Kosrae Island, the most easterly of the Caroline group (Fig. 1). He collected the first example on 15 December 1827 in the area of Lyal, another on 21

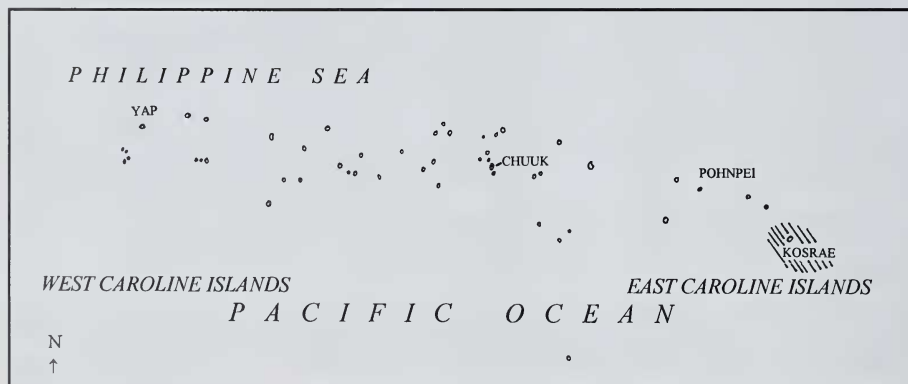


Figure 1. The Caroline Archipelago with Kosrae Island (shaded) situated furthest right. Scale 1 cm = c. 370 km.

December in the mountains, and a juvenile on 29 December in mountain woods also near Lyal; the last day of collecting on Kosrae was 30 December 1827 (Kittlitz 1858, Mees 1964). Kittlitz only recorded taking three specimens, but five skins are known to exist. As he was working for the Russians, he originally deposited three *A. corvina* specimens, as well as 300 other birds plus 200 field drawings, in the Russian Academy of Sciences, St. Petersburg (Mearns & Mearns 1992), from where some were subsequently dispersed to Frankfurt and Berlin (Hartert 1891). Kittlitz material was dispersed via Johann Georg Wilhelm Brandt (1794-1856), who was the brother of Prof. Dr. Johann Friedrich von Brandt (1802-1879), curator of the Imperial Museum, St. Petersburg (Steinheimer pers. comm). Based on his field notes and drawings, Kittlitz had three accounts and two illustrations of *A. corvina* published, although it was not until 1832 that he published detailed collecting notes; the field drawings were later engraved and coloured by himself. The text accompanying the plate in Kittlitz (1835) translates as follows:

“9) *Lamprothornis corvina* n.

From Uulan. This bird is found much less often on this island than *Lamprothornis opaca* (Lichtenstein) or *Turdus columbinus*. Gm. L. which are very common,

It looks similar to the bird discussed above [*Aplonis (Lamprothornis) opaca*] except for its size, beak length and style of living etc. It [*Aplonis (Lamprothornis) opaca*] is a sociable bird, although it does not like large flocks. It likes inhabited areas and eats mostly fruit (particularly bananas). This species [*Aplonis (Lamprothornis) corvina*] lives deep in the wooded region in the centre of the island and is just about the only bird occasionally to be seen here. It eats small animals, larger insects and lizards etc., which it swallows whole. It also seems occasionally to eat fruit, the stones of which have been found in its stomach. It [the stomach] is relatively smaller and more muscular than the other species. The mating call of this solitary bird is loud and consists of a single, often repeated tone. The young (probably in their first year) have very different feathers, so that one is led to believe that they are a completely different sort of bird. They are all over yellowy white with black/brown speckles, especially on their upper half. The iris is light brown. I would doubt if they belonged to this species, if I hadn't once shot a black bird that had white feathers still visible from the transition period. Both sexes have the same plumage, but the female seems smaller, and its black feathers are less shiny, although the males also differ here, probably due to their age.

Description. The feathers over the cere are similar to *Turdus columbinus* although more velvety. The beak and feet are black. The brow is purple-red. The feathers are shiny with a faint steel-green and purple shimmer. The tail is wedge-like - although the outside feathers are considerably shorter (Kittlitz 1835 pp. 7-8).”

It was in Kittlitz (1832) that the first illustration of *A. corvina* was published, but it received little attention and almost no circulation due to a shortage of funds; only

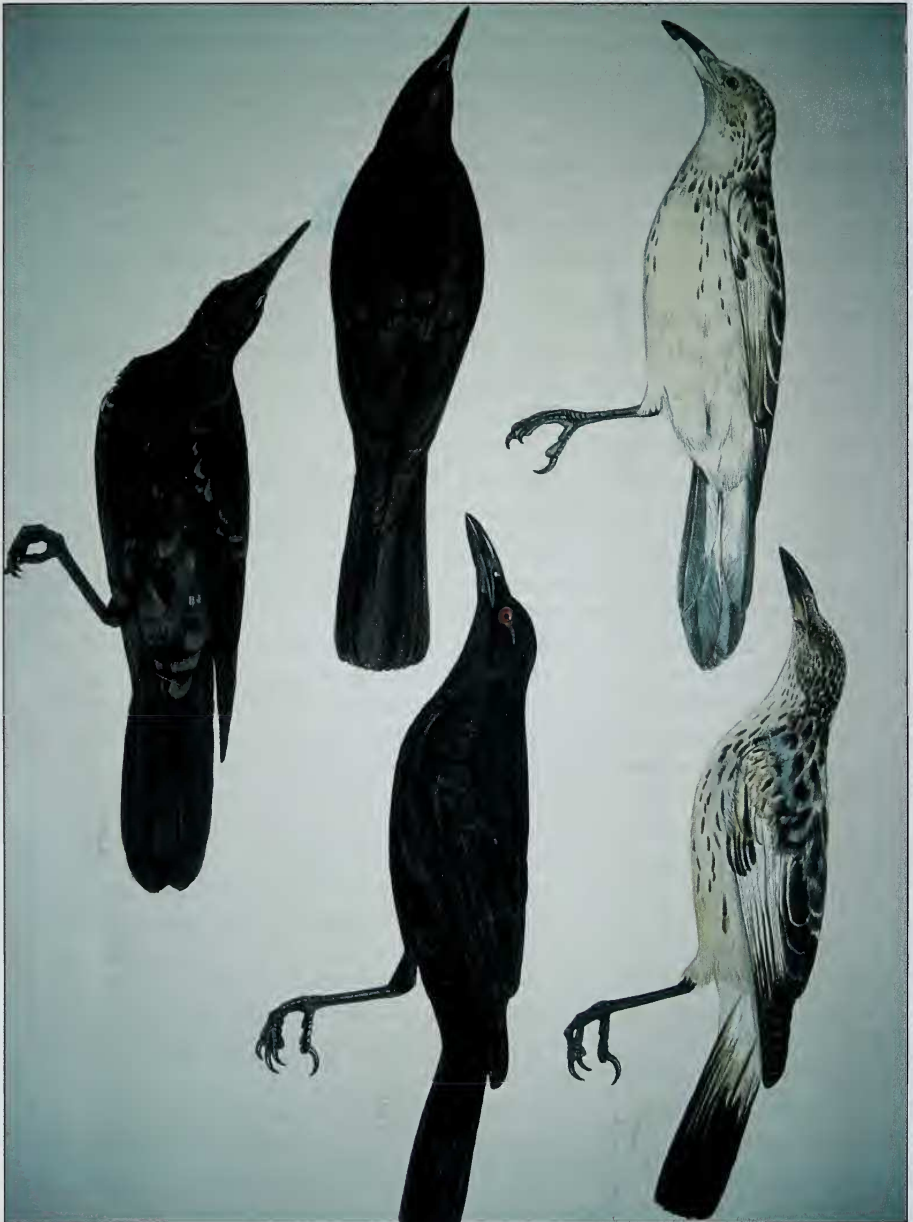


Figure 2. The five surviving specimens of Kosrae starling *Aplonis corvina* (top right) Leiden juvenile RMNH 90381; (top left) Leiden adult RMNH 90380; (lower right) St. Petersburg juvenile 138169; (lower left) St. Petersburg adult 138168; (centre left) St. Petersburg sub-adult 138167.

a few copies were ever printed (Mearns & Mearns 1992). It refers briefly to the text of 1835 (as the 1835 publication preceded the 1832 publication) with some variation as follows:

“Fig 3. - This is a new species, found on the island of Uulan, and was called *Lamprothornis corvina*. Written details and life-size picture must have appeared in the newest memoirs of the Academy of St. Petersburg [referring to Kittlitz 1835].

It has similarities to fig 2 [*Aplonis opaca*], but there are slight differences due to its animal-like food; big insects such as crickets and similar, and little lizards make up its main diet. It sometimes complements its diet with fruits thus its stomach is smaller and more muscular than that of other species. This is a solitary bird living in the deepest mountainous forest regions avoiding man. The young are yellowy white, with black/brown spots. Adult males and females are both black (Kittlitz 1832 pp. 12-13).”

It is evident from Kittlitz's notes that he was a fairly keen observer and recorded details with some care. The illustration in Kittlitz (1835) reproduced *A. corvina* life size and included a line drawing of the bifurcated tongue.

Description of specimens

(All specimens measured by and illustrated (Fig. 2) by the author)

St Petersburg specimens

Juvenile (138169)

Basal colour whitish-cream, whiter on the back and bases of primaries/secondaries. The under belly and under tail coverts more buff. Chocolate-brown speckling on head, neck and shoulders, each feather edged with buff. Tail and primaries chocolate-brown, lighter brown on back. Breast speckles with dark centres, fading to buff-brown with white edges. Under tail mid brown distally, more rufous proximally. Upper tail white at the base merging into buff then chocolate brown at the tips. Very fine buff speckles on throat, chin and face. Feathers without gloss. Bill pale yellow at base merging into dark brown/black towards tip. Edges of bill soft. Tarsus dark brown/black. Iris recorded as light brown. Measurements (mm): wing (from bend of wing to tip of primary) 140, tail (base of undertail coverts to tip) 100, total length (bill tip to tail tip) 270, bill length (tip to base of cranium) 31, bill depth (at point of distal end of operculum) 10, tarsus 38.7.

Sub-adult (138167)

Overall colour black, browner on underside. Buff or white flecks and edgings on underside, lower back, secondaries and wing coverts; very distinctive on undertail coverts. Iridescent green/purple (depending on light) on upperparts, less on underside, with no gloss on primaries or tail. Bill and tarsus entirely black. Iris recorded

as bright red. Measurements (mm): wing 142, tail 100, total length 280, bill length 32.9, bill depth 10, tarsus 38.

Adult (138168)

Completely glossy black with predominantly green iridescence but also purple, particularly on the head and neck depending on the light. Wings and tail iridescent green and purple but much less extensive and distinct; primaries without gloss. Bill and tarsus entirely black. Iris recorded as bright red. Measurements (mm): wing 145, tail 105, total length 290, bill length 33.5, bill depth 10, tarsus 38.2.

A note accompanying the St. Petersburg specimens describing the label history translates as follows:

“In the Zoology Institute are the following specimens: No. 138167 - first year, which has on some black feathers of undertail, belly and shoulders (small upper wing coverts) rather worn light brown edgings;

No. 138168 - adult; No. 138169 - young bird in nestling plumage. The labels of the author are the same: “No. 102, *Lamprothornis n. sp.* Ualan, v. Kittlitz.” Later, *n.sp.* was crossed out by a member of staff of the Zoological Museum, Academy of Sciences and written “*corvina*” (Neufeldt 1978 p.107).”

Leiden specimens

Juvenile (female?) RMNH 90381

Basically similar to the St. Petersburg specimen of a juvenile. Mees (1964) recorded the bill as less curved than for the adult and the edges of the rostrum/maxilla softer, not fully keratinised. Base of the bill light-coloured as in the St. Petersburg specimen. Iris colour not recorded. Measurements (mm): wing 137, tail 97, total length 292, bill length 31, bill depth 7.5 (damaged), tarsus 35.

Adult (male?) RMNH 90380

Similar to St. Petersburg specimen but black with a light-blue and rose gloss; the wings iridescent green. Bill all black. Iris colour not recorded. Measurements (mm): wing 136, tail 104, total length 250, bill length 30, bill depth 9, tarsus 33.5.

Provenance of the Leiden specimens

The two Leiden specimens and their history remain a mystery. A specimen was recorded as being seen in Frankfurt (Steinbacher 1954) but subsequently disappeared. As far as it is known, only Kittlitz saw and collected this species. He never sexed the St. Petersburg specimens, yet the Leiden specimens are labelled as male and female (Mees 1964). However, my examination of these specimens reveals that Coenraad Jacob Temminck (his name is hand written on the labels), founder and first director of the Rijksmuseum van Natuurlijke Historie, had, based on colouration, sexed the specimens after they had been skinned. This sexual determination certainly cannot be relied on. Furthermore, Temminck not only knew the foremost zoologists of his

day personally, he exchanged (apart from a pair) every other duplicate bird and bought many specimens for the Rijksmuseum in the middle of the Nineteenth Century, particularly from Germany (Holthius 2001). It is quite possible that Temminck obtained two *A. corvina* specimens directly from Kittlitz and Kittlitz had actually collected more specimens than he mentions in his notes. His voyage was poorly funded and it would have been financially beneficial to collect extra specimens for later dispersal.

However, the possibility also exists that the specimens were exchanged from the Frankfurt collection. Until the 1840s, Edward Rüppell (1794-1884), curator of Frankfurt museum, exchanged duplicate material of high importance, which included Kittlitz material and types. As Frankfurt possessed at least one specimen of this species before WWII - E. Hartert (1891) listed one in the catalogue of the collection as donated by Baron v. Kittlitz - excess material may have been exchanged with Temminck at Leiden; Rüppell did so at least with other specimens (Steinheimer pers. comm.). Unfortunately, this sixth specimen of *A. corvina*, supposedly residing in Frankfurt (Fuller 2001) has disappeared (Mayr pers. comm.). The complete skin collection was evacuated and dispersed to several different 'safe deposits' around Frankfurt during World War II and Steinbacher (1954) presumed the specimen was lost as one of these deposits was destroyed by bombing.

Relationships

Aplonis starlings are primitive, generally unspecialised and form an island complex of fruit eating arboreal species that occur only on oceanic islands and adjoining continental masses (Amadon 1943, 1956, Beecher 1978). Some members of the genus share a number of characteristics which indicate relict or long-isolated populations, e.g. the lack of gloss in some species (a retention of the juvenile characteristic), bill morphology, large size, sexual dimorphism and limited distribution (Feare & Craig 1998). Table 1 and Fig.3 give a comparative summary of morphological, biogeographical and behavioural characteristics of members of the genus, aspects of which are discussed below.

Size

A. corvina is equivalent in size to the larger members of the genus, namely Long-tailed Starling *A. magna*, Samoan Starling *A. atrifusca*, and Large Glossy Starling *A. grandis*. Interestingly, all these large species have limited distribution, confined to island groups or single islands and have probably been isolated for a long time. Other members of the genus are all small to medium-sized birds.

Gloss

Gloss reduction has generally occurred in the *Aplonis* spp. with restricted distribution, but also in the widespread but isolated Polynesian Starling *A. tabuensis*, suggesting a long isolation from their fully glossed congeners (Feare & Craig 1998). However, full gloss also occurs in isolated endemic populations, notably the Kosrae *A. corvina*, and Long-tailed Starling *A. magna*. If these species have indeed been isolated for a

TABLE 1

Comparison of morphological, biogeographical and behavioural characteristics of the genus *Aplonis* (after Feare & Craig 1998, Hume *pers. obs*). F = fruit, I = insects, V = vertebrates

Species	Total length (cm)	Gloss	Sexual dimorphism	Juvenile	Food	Migrant Distribution
<i>A. atrifusca</i> 22	30	yes (reduced)	no	dull brown	F	no island group
<i>A. brunneicapilla</i> 12	21-32 (inc. tail)	yes	size, less gloss	duller, inconspicuous white streaks on underside	F	no island group
<i>A. cantoroides</i> 10	17-19	yes	no	dull, dark brown above, white with dark streaks below	F	yes widespread
<i>A. cinerascens</i> 23	21	yes (reduced)	no	?	F + I	no endemic
<i>A. corvina</i> 9	27-29	yes	size?, less gloss?	cream and white, speckled/ streaked black and brown	V+I+F	no endemic
<i>A. crassa</i> 3	20	yes	no	dull, dark brown above, white with dark streaks below	F	no endemic
<i>A. dichroa</i> 15	18-21	yes (reduced)	no	browner, less gloss	F	no endemic
<i>A. feadensis</i> 11	20	yes	no	duller, scaly on underparts	I	no island group
<i>A. fusca</i> 20	17-18	yes (reduced)	no	?	F	no endemic
<i>A. grandis</i> 14	25-29	yes	no	duller	F	no island group
<i>A. insularis</i> 16	19	yes	no	dull, no gloss	?	? endemic
<i>A. magna</i> 5	28-41 (inc. tail)	yes	no	?	F	no endemic
<i>A. mavornata</i> 24	18	yes (reduced)	?	?	?	? endemic
<i>A. metallica</i> 13	21-26	yes	no	dull, dark brown above, white with dark streaks below	F	yes widespread
<i>A. minor</i> 2	18	yes	no	dull, underparts white streaked with black	F	yes widespread
<i>A. mysolensis</i> 4	20	yes	no	brown above, streaked below	F	no island group
<i>A. mystacea</i> 6	18-19	yes	no	dull, dark brown above, white with streaks below	F	no island group
<i>A. opaca</i> 7	24	yes	size, plumage	dull, streaked underparts	F	no widespread
<i>A. panayensis</i> 1	17-20	yes	duller	paler, buffish and streaked below	F	yes widespread
<i>A. pelzelni</i> 8	16	yes (reduced)	no	paler	F?	no endemic
<i>A. santovestris</i> 17	17-18	yes (reduced)	no	?	F	no endemic
<i>A. striata</i> 18	18	yes	size, plumage	?	?	no island group
<i>A. tabuensis</i> 21	17-21	yes (reduced)	no	?	F	no widespread
<i>A. zealandica</i> 19	19	no	no	paler	F	no island group

long period, it appears that gloss retention may occur just as readily as gloss reduction and therefore cannot be diagnostic of isolated or relict populations.

Sexual dimorphism

The sexes of most species of *Aplonis* are similar, but sexual dimorphism does occur in four species. Size differentiation (smaller females) and/or female plumage patterns are distinct in Norfolk and Lord Howe Island Starlings *A. fusca*, Micronesian Starling *A. opaca*, and Striated Starling *A. striata*. Less distinct dimorphism occurs in the White-eyed Starling *A. brunneicapilla*, with females being less glossy and smaller. Kittlitz (1835) mentioned female *A. corvina* as being smaller and less glossy in his field notes. Unfortunately, as the original labels for the sexed Leiden specimens are missing, and Kittlitz never sexed the St. Petersburg specimens, any sexually dimorphic characteristics must be approached with caution, especially as the Leiden juvenile female is larger than the adult male in wing, bill and tarsus length.

Bill morphology

Bill morphology varies in the genus from small and pointed (Pohnpei Mountain Starling *A. pelzelni*, Mysterious Starling *A. mavornata*) through broad (Yellow-eyed Starling *A. mystacea*), to large and heavy (Samoan Starling *A. atrifusca*, Kosrae Starling *A. corvina*). However, distributional groupings of *Aplonis* have little in common (Fig. 3). As the largest bills belong to Samoan Starling and Kosrae Starling,

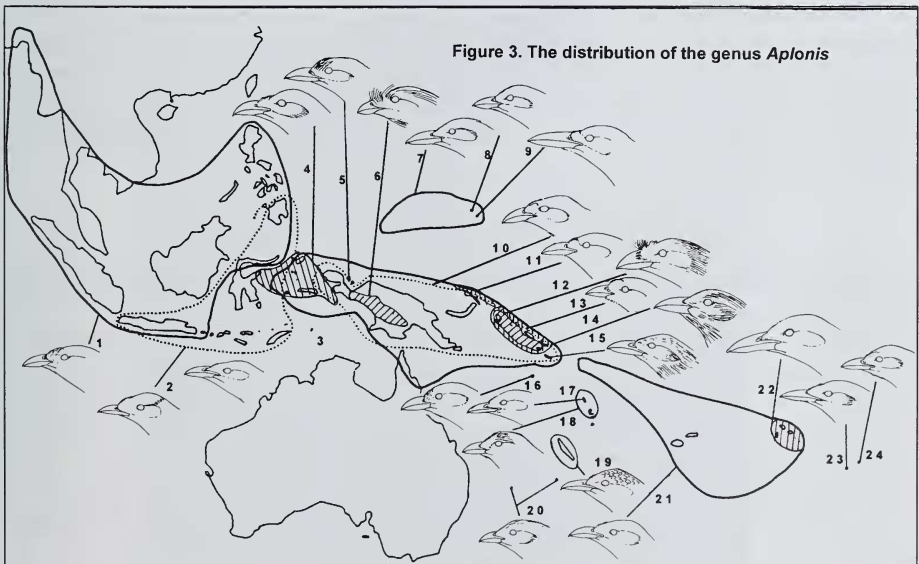


Figure 3. The distribution of the genus *Aplonis* and the bill morphology of the 24 species. Original distribution map from Feare & Craig (2000); drawings of heads by the author. Refer to Table 1 for key to numbered species.

of widely separate Samoa and Carolines respectively, a possible relationship between these two species based on this character and large size (Mees 1964, Day 1981), seems unlikely. Furthermore, in the Samoan Starling, the plumage is brown and almost without gloss and the juveniles are dull versions of adults. Probably due to prolonged lack of recognition, the Leiden specimens were actually deposited with Samoan Starling *A. atrifusca* (Mees 1964), hence the long period for which they went unrecognized.

In Kittlitz's illustration (1835, tab. 9,) the bill as depicted is far too slender (Fig. 4), a basis on which Sharp (1890) doubted the generic placement of *A. corvina* (see also Hartert 1891).

Juveniles

Distinct juvenile plumage patterns occur in all species to some degree and juvenile *Aplonis* are generally dull versions of the adults and/or have marked plumage differences with increased black/brown streaking on white or beige underparts (Table 1). However the degree of differentiation shown in juvenile *A. corvina* is unique in *Aplonis*, and in all other starling genera. It has also been suggested that the juvenile plumage described above represents a leucistic condition (Feare pers. comm.). The second juvenile individual from Leiden verifies that this plumage was not atypical, and the intermediate plumage recorded by Kittlitz lends support to the juvenile/adult moult being a transition between the "pied" juvenile and adult plumages. However, there is still a possibility that the Leiden juvenile was a sibling of the St. Petersburg juvenile, and thus both may be aberrant offspring.

The White-eyed Starling *A. brunneicapilla*, Singing Starling *A. cantoroides*, Tanimbar Starling *A. crassa*, Shining Starling *A. metallica*, Short-tailed Starling *A. minor*, Island Starling *A. mysolensis*, Yellow-eyed Starling *A. mystacea*, Micronesian Starling *A. opaca*, and Asian Glossy Starling *A. panayensis* share, with *A. corvina*, distinctive streaked underparts, but this feature bears no apparent relationship to distribution (Table 1).

Conclusions

Morphologically, the Kosrae Starling was not only one of the largest members of the genus *Aplonis* but also had a specialised, almost crow-like heavy bill. Its diet, consisting mainly of animal matter, may have differed from the predominantly frugivorous diet of other *Aplonis*. Its stomach was noted as being smaller and more muscular than *A. opaca*, a possible adaptation for a diet in which animal matter predominates. However, this evidence is based on only 5 specimens; Common Starlings *Sturnus vulgaris* have larger stomach and intestines in the winter, when more vegetable matter is consumed (Feare 1984). It was the most frequent bird encountered in the mountains when first discovered but already comparatively rare. Kittlitz (1835) described mating calls during December, but as fledged young were taken, it was more likely that he heard loud contact calls. *A. opaca* fledged after 21-25 days, becoming independent shortly afterwards (Feare & Craig 1998), and if the

fledging period of the Kosrae Starling was similar, this suggests that the juvenile *A. corvina* collected were fledged by late November. That the juveniles were recently fledged is further supported by the soft rhamphotheca of both juvenile specimens, a characteristic of a very young bird (Mees 1964). The sub-adult specimen indicates that the adult gloss was not achieved at least until the following year, a phenomenon not uncommon in other Sturnidae (Feare & Craig 1998).

Relationships

Relationships within *Aplonis* are complex and confusing, with morphological variation and former distribution difficult to determine. *Aplonis* starling distribution appears to represent complex pulses of range expansion, colonization and probable extinction, sometimes resulting in isolated or sympatric populations. In the Kosrae Starling, differences from other members of its family in diet, bill shape, and distinctiveness of juvenile/adult plumage suggest specialisations indicative of prolonged isolation.



Figure 4. The first published illustration of the Kosrae Starling *Aplonis corvina*, including (middle right) the bifurcated tongue.

Aplonis and other problematic island genera, e.g. *Dicrurus*, would certainly benefit from DNA analysis to provide independent evidence of their phylogenies.

Competition with *Aplonis opaca*?

A. corvina was sympatric with the smaller, widespread Micronesian Starling. Amadon (1956), King (1981), Fuller (1987) and Feare & Craig (1998) have suggested that *A. corvina* was restricted to the mountains and was possibly displaced/out-competed in the lowlands by the more recent arrival of *A. opaca*, which is a lowland bird. Areas of habitation favouring *A. opaca* have certainly increased since the Second World War due to anthropogenic activity (Baker 1951). Range expansion of *A. opaca* may have also occurred on Kosrae towards the end of the 19th Century, as it was during this time that the Carolines suffered an upsurge in deforestation (King 1981). The endemic Pohnpei (formerly Ponape) Mountain Starling, a species now restricted to the mountains, originally occurred all over the neighbouring island of Pohnpei (Fig. 1) and a nearby atoll (Baker 1951, King 1981, Buden 1996, Feare & Craig 1998). This species is also sympatric with *A. opaca* and it is therefore unlikely that the montane restriction of *A. corvina* was due to competition with *A. opaca*. It is most likely that *A. corvina* required undisturbed forest, and that the extent of this was the main factor in determining its distribution.

Extinction

The factors that caused the extinction of *A. corvina* remain a mystery. Otto Finsch, who visited Kosrae in February 1880, was familiar with the bird, having seen the St. Petersburg specimens (erroneously stating two instead of three) and noted the distinctiveness of the species (Sharpe 1890). Kosrae Island, lying furthest east within the Caroline Archipelago, had not been overly exploited as it lay off the main shipping routes (Mees 1964), although the other Caroline Islands were generally known to shipping (Fuller 1987). It was still densely wooded at the time of Finsch's visit and the human population numbered only 300 individuals (Finsch 1881), so the mountainous central region would surely still have provided refuge. Finsch thought that it still existed and noted that the human population, already decimated by the influence of western contact, did not venture into the mountains anymore (Sharpe 1890); Finsch himself never searched the interior (Mees 1964).

Rats have been cited as a probable cause of extinction (Greenway 1957, Fuller 1987). Ships were often careened on shore and rats could easily escape. It appears that they were present in some numbers on Kosrae, as Kittlitz (1858) noted them as 'being common and found in banana plantations' even as early as 1827. The wide-ranging *A. opaca* appears to be able survive, despite rat predation, on Kosrae and other islands; it is still commonly found in the lowlands (Feare & Craig 1998). *A. opaca* nest in hollow trees and this, coupled with its aggressive nature, may help reduce rat predation (King 1981, Feare & Craig 1998) but it still is heavily preyed upon by rats (Baker 1951, Greenway 1957). This species is more susceptible to the tree climbing Black Rat *Rattus rattus* and the Pacific Rat *R. exulans*, than the more terrestrial

Brown Rat *R. norvegicus*. No assessment can be made with respect to rat predation on breeding Kosrae Starlings as no nests were ever recorded. Generally, *Aplonis* spp. nest in tree cavities, with only two species building pendulous nests. *A. pelzelni* nests in tree cavities, as does the other Mountain Starling, *A. santovestris* (Feare & Craig 1998) and similar nesting requirements may have applied to *A. corvina*.

The Kosrae Starling, being specialised, shy and retiring, must have been very susceptible to human disturbance and hunting, and tree-climbing rats may have been nest predators and/or competitors for food. Also, introduced avian disease, a factor that proved so devastating to the avifauna in the Hawaiian Islands, may have been partly responsible. It is more than likely that a combination of events was to blame for the extinction of *A. corvina*.

Whatever the circumstances surrounding its extinction, the Kosrae Starling is only known from the five individuals in Leiden and St. Petersburg, all of which are syntypes (Mees 1964). It was only ever seen and recorded in the wild between the 15 and 30 December 1827 by F. H. von Kittlitz. It was still possibly alive and overlooked in the 1880s, as Finsch never penetrated the interior. It was certainly extinct by 1931, as the interior was thoroughly searched by F.J.Coultas of the Whitney Expedition of the American Museum of Natural History (Greenway 1957) and other Japanese expeditions (Mees 1964). It is the good fortune of science that the Kosrae Starling was collected and recorded in life, albeit for just 15 days.

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First record of the Rufous Potoo *Nyctibius bracteatus* and in-flight drinking by the Semi-collared Nighthawk *Lurocalis semitorquatus* in French Guiana

by Nigel Cleere & Johan Ingels

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Between 6 September and 6 October 2000, we conducted nocturnal surveys at several localities around the village of Saül (53°12'W, 03°35'N) in central French Guiana. Records of two Caprimulgiform species are of particular importance and are documented here.

RUFIOUS POTOO *Nyctibius bracteatus*

One heard on 20 September from primary rainforest along the Creek Limonade, c. 5 km south of Saül. It called almost continuously between 0515 and 0600 h, with pauses of